

DOCUMENT RESUME

ED 249 059

SE 045 064

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TITLE Different Living Things. Seychelles Integrated Science. [Teacher and Pupil Booklets.] Unit 5.
INSTITUTION National Inst. of Pedagogy (Seychelles).
SPONS AGENCY Ministry of Education and Information (Seychelles).
PUB DATE 83
NOTE 51p.; Document contains several pages of marginal legibility. For units 1 through 13 of this series, see SE 045 060-072.
PUB TYPE Guides - Classroom Use - Materials (For Learner) (051) -- Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Animals; *Biology; *Classification; Curriculum Development; Integrated Curriculum; Junior High Schools; *Science Activities; Science Curriculum; Science Education; *Science Programs; *Secondary School Science; Units of Study
IDENTIFIERS Plants (Botany); *Seychelles Integrated Science Program

ABSTRACT

Seychelles Integrated Science (SIS), a 3-year laboratory-based science program for students (ages 11-15) in upper primary grades 7, 8, and 9, was developed from an extensive evaluation and modification of previous P7-P9 materials. This P7 SIS unit is designed to: (1) help students develop an elementary understanding of how living things can be classified into groups; (2) help students develop the ability to construct and use a simple key to classify either living or non-living materials; and (3) familiarize students with the names and characteristics of a wide range of local animals and plants. Provided for the unit is a student workbook and a set of teaching notes. The teaching notes include the general aims of the unit and a lesson plan for each topic area. Each lesson plan includes a suggested time frame, a list of objectives, a list of equipment needed, and a suggested lesson format. This format includes suggestions for introducing the lesson, instructional strategies (emphasizing procedures for student activities), and evaluation methods. The student workbook includes procedures for completing the unit activities and a list of new words keyed to page numbers in the workbook. (JN)

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seychelles integrated science

Unit 5

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The Goals of Unit 5.

Unit 5 is the final unit of the P7 Programme. In it we try to get the pupils out and about as much as possible. Most of the collecting should be done around the school. Some schools in town may need to arrange to walk to a nearby open or over-grown area.

In the unit we want to teach the pupils some basic ideas about classification but we wish to familiarize them with the names and characteristics of a wide range of local animals and plants.

Overall the unit has 3 main goals.

- 1) To develop in the pupils an elementary understanding of how we can classify living things into different groups.
- 2) To develop the pupils' ability to construct and use a simple key to classify either living or non-living materials.
- 3) To familiarize pupils with the names and characteristics of a wide range of local animals and plants.

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Unit 5

Topic 1

Similarities and Differences

Time

Two to three periods.

Objectives

At the end of the Topic the pupils should:

- 1) be able to recall five similarities and five differences between themselves and each of the following; a mammal, a fish, a lizard, a flowering plant and a rock.
- 2) be able to explain in their own words how we are more closely related to other mammals than we are to fish and lizards and to plants and rocks.

Equipment

A slide set has been prepared for use with Unit 5. For Topic 1 you may use slides I - 7. You should also have a number of photographs or posters of other common animals and plants.

If possible also have a number of living things in the classroom, for example; a lizard, a fish, a spider and a flowering plant.

Suggested Lesson Format

Introduction

Ask the pupils who is the tallest and who is the smallest in the class. Get them to stand beside each other. Now ask if there are any children in the class who look alike.

Let them stand beside each other and note some of their similarities.

Activity

Get everyone to read Section 1.0 and 1.1. Then let the pupils work in pairs to list their similarities and differences.

Let a number of them report on their lists and use these to prepare a summary on the board.

ME	ANOTHER PUPIL	CAT		

At this point show a mammal (e.g. a cat) or a slide of a mammal.

Then go over the similarities listed in the results table, one by one, asking the pupils if the other mammal has all of the similarities, that the two people had, if not what differences were there.

Complete the results table on the board, showing how much the mammal is similar to a human.

Show the lizard and ask the pupils to work with a partner and complete the table for the lizard. Discuss the results and bring out the point that the lizard is less similar to the person than the mammal, e.g. no hair or fur, 'cold' not warm to touch, doesn't feed young on milk.

Repeat this with the fish, the plant and the rock, each time bringing out the point that these things are less like the person. (objective 1).

Discussion & Evaluation

Ask the pupils to draw up a list showing at the top the thing which is most like a human and putting at the bottom the thing which is least like a human. Allow a number of pupils to report on their list and the reasons for their order.

LESSON

Unit 5

Topic 2

Living and non-living Things

Time

About two periods

Objectives

At the end of the Topic the pupils should be able to:

- 1) recall three living and three non-living things.
- 2) recall at least three differences between living and non-living things.
- 3) to identify whether a thing is living or non-living by asking five questions which can only be answered by a 'yes' or 'no' answer.

Equipment

Have a variety of living and non-living things for the pupils to look at, e.g. plants, insects, other invertebrates, fruits, seeds, bottles, beakers. Have at least 12 different things.

Suggested Lesson Format

Introduction

Write the words living and non-living on the board. Tell the pupils that you are going to ask them to explain the difference between a living and a non-living thing, but first they can discuss it with their partner for a moment and prepare a reply.

Allow a number of pupils to make suggestions, you should point out how a definition isn't complete (e.g. living things move- but so do motor cars).

Activity

After some discussion let the pupils read Section 2.1.

Afterwards allow a few minutes for discussion on how the pupils decided on their classification. Bring out objectives 1 and 2.

Now get everyone to read Section 2.2. Go over the 'rules' with the pupils and then allow 10 - 15 minutes for each group to draw up its five questions and write them out. You and the technician should help with the spelling where necessary. (objective 3)

Discussion and Evaluation

Allow different groups to challenge each other in front of the class, to try and get an 'exception'. E.g. Group A thinks of something and Group B ask their five yes/no questions and then have to say for certain whether the 'something' is living or non-living.

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LESSON

Unit 5

Topic 3

Animals and Plants

Time

Two to three periods

Objectives

At the end of the Topic the pupils should:

- 1) be able to recall the names of five living organisms which are animals and five which are plants.
- 2) be able to devise and explain in their own words a set of 'rules' which help distinguish animals from plants.

Equipment

The pupils should bring in a wide collection of different living things. In case the collection is too small, have a few items ready to include. You may need to provide some plastic bags and jars beforehand.

Suggested Lesson Format

Introduction

Revise with the pupils their 'definitions' of living and non-living based on their five questions. Arrive at an agreed list on the board and then tell the pupils that you want them to go out around the school grounds to collect as many different living things as possible.

Activity

Organize the pupils and set down rules about where they can or cannot go. E.g. You should tell them not to collect a chicken or vegetables from the Agriculture Project.

Let the pupils go out in groups. You and the technician(s) should stay with them.

Back in the classroom ask the pupils to divide their living things into two groups - plants and animals.

You and the technician should move from group to group asking them to explain how/why they have classified the things the way they have.

Let the pupils read Section 3.2, and then ask them to draw up their set of rules.

Move from group to group and ask each group to name five plants and five animals and to explain why they are plants and animals using their list of rules.

Discussion and Evaluation

Let the different groups challenge each other's rules. Then let the group with the 'best' rules challenge the class. Discuss their rules and improve on them if necessary and finally let the group write them on the board.

LESSON

Unit 5

Project 1

Different Types Of Plants

Time

Two to three periods

Objectives

At the end of the Project the pupils should:

- 1) knew that green plants contain chlorophyll and that it is needed by the plants to make food.
- 2) for at least two local plants be able to identify the leaves, and the flowers.

Equipment

You will need a leaf, a flower and a seed or tuber of any common local plant.

Each group of pupils will need:

- a burner, tripod and beaker of water
- a test-tube with 10-20 mls of clear alcohol.
- a leaf
- tweezers

Suggested Lesson Format

Introduction

Discuss the previous days work on the 'rules' about plants and animals. From this identify the main 'characteristic' of a plant as the fact that it makes its own food.

Activity

Allow some discussion on how plants make their food. Don't go into this in detail at present but from Unit 4 the pupils will know that plants need water to grow. Now bring out the point that they need light to make their food. (e.g. by asking what will happen to a plant if we keep it in a dark cupboard?)

Explain that to make their food, plants need sunlight and a special chemical in their leaves called 'CHLOROPHYLL'. Tell the pupils that today they are going to take out some of the chlorophyll from a leaf. Explain and demonstrate (without doing the actual experiment) how the pupils should 'boil' the leaf in the test-tube of alcohol - which has been heated in a beaker of boiling water. Let the pupils remove their leaves with the tweezers and look at the green solution of 'chlorophyll'.

Get the pupils to read Section 2 and 3. Ask one or two to 'describe' what they are going to do. After some discussion, show the leaf, flower and seed etc. of the plant you have. Then ask the pupils to each prepare a report about it. Let them work in pairs and allow 5 - 10 minutes for them to 'write up' a report in their books. You will need to go around helping and checking on each pair.

When you are satisfied that each pair can do this allow them to go out into the school grounds to prepare reports on at least two other plants.

Discussion

Let the pupils finish writing up their reports in the classroom, you and the technician should help the different groups.

As you move from group to group ask the pupils to describe the shape of the leaves and flowers of their plants. (objective 2). Afterwards you may hold a 'competition' to see who can identify the leaves and flowers of five or six common plants.

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LESSON

Unit 5

Topic 4

Some small animals

Time

Two to three periods

Objectives

At the end of the Topic the pupils should:

- 1) be able to divide a collection of 'small' local animals into two groups, those with legs and those without.
- 2) from a selection of six 'small' local animals which have legs be able to distinguish between those which have more than six legs, and those which have six legs or less.
- 3) from a selection of six 'small' local animals which do NOT have legs be able to distinguish between those which have a 'hard shell' and those which have no shells.
- 4) be able to recall the names of at least one example of each of the following:
 - a) a local 'small' animal which has six legs.
 - b) a local 'small' animal which has more than six legs.
 - c) a local 'small' animal without legs but with a shell.
 - d) a local 'small' animal which has neither legs nor a shell.

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By 'small' animal we mean an invertebrate but the pupils will not be introduced to this word until Topic 5.

Equipment

During the Topic the pupils will be asked to make a collection of 'small' animals. Each group will need five or six small jars - some of which should have lids. Plastic bags would also be useful.

Suggested Lesson Format

Introduction

Explain to the pupils that today they are going out into the school grounds to collect as many different 'small animals' as possible. Give examples of what you mean by a 'small animal'. E.g. spiders, snails and ants and NOT dogs, cats and rats.

Organize the pupils into groups and make sure each group has some jars and lids and plastic bags or basins.

Activity

Let the groups search for and collect as many animals as possible. You and the technician(s) should move around the grounds with them.

Back in the laboratory ask the pupils to divide their own collection into two different groups.

Allow 5 - 10 minutes for them to discuss and do this - then ask each group to explain to the class how they formed the two groups.

Afterwards ask those groups who used a different method to now divide their collection into those with and those without legs. Bring out the point that this is simply another method of sorting - we could use a number of different methods.

(objective 1)

Discussion and Evaluation

Move around from group to group and ask the pupils to 'tell you' about individual animals by answering a set of questions:

'Is it an animal or plant?'

'Does it have legs or not?'

'Does it have more than six legs?'

'Does it have a hard shell?'

With the whole class, name an animal and ask individuals to 'describe' it using the same set of 'rules'. (objective 4).

Unit 5

Summary 1

Using A Key

Time

One to two periods

Objectives

At the end of the lesson the pupils should:

- 1) be able to classify each of the six (invertebrate) animals listed on Page 9 of the pupils' book according to whether it has
 - a) six or more legs
 - b) a hard shell or not
- 2) Given a simple key, involving three stages, be able to use it to identify an organism.

Equipment

You will need specimens of each of the eight animals shown on page 9, of the pupils booklet - preserved specimens will do. If these are not all available use a slide or photograph. Also have specimens or slides of an earthworm, a snail and a slug.

Suggested Lesson Format

Introduction

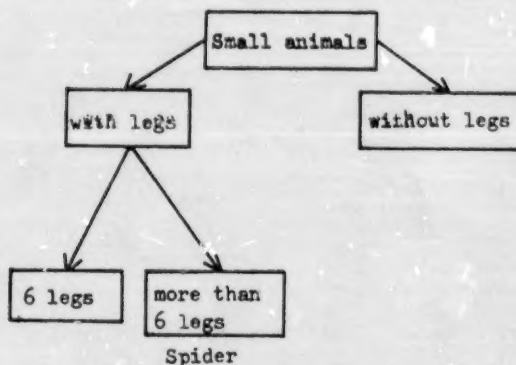
Revise objective 4 from Topic 4 asking the pupils to describe an animal, that you name, according to the 'rules' you used last day.

Activity

Let the pupils look at the spider. Let them classify it according to whether it has legs or not, then whether it has six legs or more.

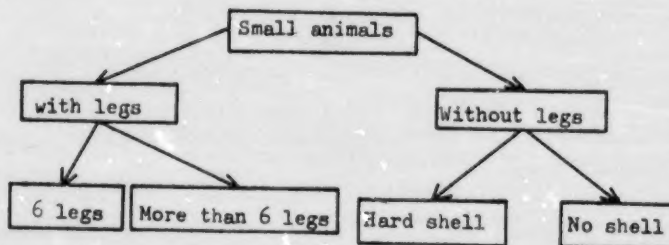
Having decided that it is a small animal - with legs, and with more than six legs.

Draw one half of the key on the board.



Now let the pupils look at the butterfly or cricket. Point to the first 'box' - small animals and then ask - "For the butterfly which way will we go - this way or that way?" Follow the key down and then write the name (butterfly) under the box for 6 legs. Show the barnacle (or snail) and again ask the pupils 'which way?' Then ask 'what should the next two boxes say?'

Complete the key on the board.



Bring one pupil up to the board to show how to use the key to 'classify' an earth worm.

Get everyone to copy the key into their books and then ask them to classify four or five other animals (objective 1) such as - a snail, a slug, a woodlouse and an octopus. (In this key the octopus will be in the same group as the spider).

Allow a few minutes for pupils to do this and to discuss their results with their partners. (objective 2).

Discussion and Evaluation

Discuss the results with the class. Show the ragworm and tell the pupils that 'this one is a little difficult'. Ask them to classify it - afterwards allow some discussion and bring up the point that some people feel that it does not have legs but only tiny hairs which aren't real legs.

At this stage it is not important how we classify the ragworm. The class should choose whether it should be classified 'with' or 'without' legs. But bring out the point that sometimes with keys it is difficult to decide what group an animal or plant will belong to.

LESSON

Unit 5

Project 2

Making A Key

Time

About two periods

Objectives

At the end of the Project the pupils should be able to:

- 1) Revise four questions which give yes or no answers only but which between them identify each individual shown on page 10 of the pupils books.
- 2) use these four questions to construct a simple key for identifying individuals on page 10.

Equipment

No special equipment needed.

Suggested Lesson Format

Introduction

Get the pupils to look at the drawings of the children on page 10 of their books. Ask them can they find two who are exactly alike. Allow some time for them, to search, and for discussion to clarify that no two are exactly the same.

Activity

Explain the 'story' about an old lady seeing one of the children stealing something. They can ask her 4 questions - but she can only answer yes or no to each question.

Let the pupils work in groups of 3 or 4 to think up their four questions. They can look at the drawing on page 10 - but should not read page 11 yet (objective 1).

The four questions should be:

'Is it a boy?'

'Does he (she) have glasses?'

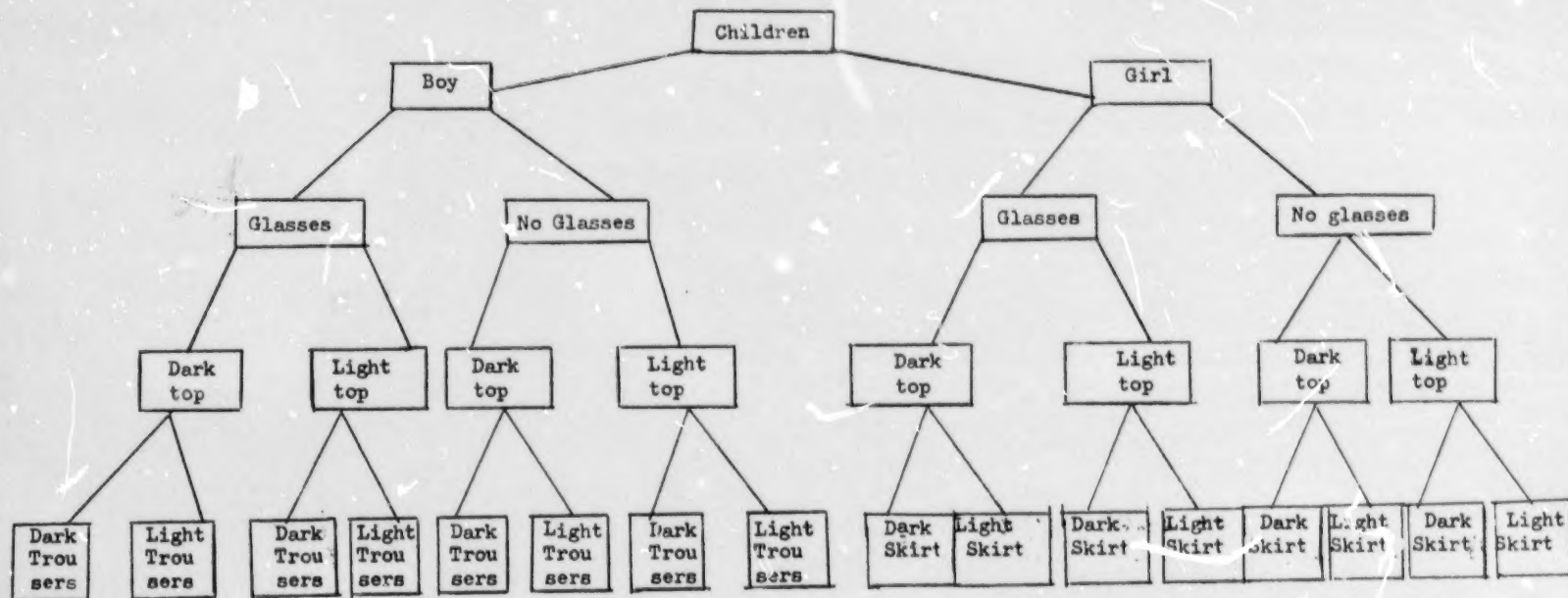
'Does he (she) have a dark top?'

'Does he (she) have a dark skirt (or trousers)?'

Discussion and Evaluation Allow the children to report on their questions and then let them try the questions to see if they work. One pupil should select a 'thief' and secretly write down the thief's number using the grid at the side and bottom. E.g. B.2.
(You may need to show the pupils how to label someone using the grid).

A second pupil must identify the thief after the four questions.

Now show the children how these four questions form a key we can use to identify the thief. Draw the key box by box on the board as the pupils ask the questions - and check that they can follow it. (objective 2)



LESSON

Unit 5

Topic 5

Animals with Backbones

Time

Three to four periods

Objectives

At the end of the Topic the pupils should be able to:

- 1) Recall that animals with backbones are called vertebrates and those without backbones are called invertebrates.
- 2) Recall the names of five vertebrates and five invertebrates.
- 3) Prepare and assemble the skeleton or 'skeleton picture' of a fish or other small vertebrate animal
- 4) Explain using their own words the major identifying characteristics of mammals, birds, reptiles, amphibians and fish.
- 5) Recall the names of at least two local mammals, birds, reptiles, amphibians and fish.

Equipment

Have the 'specimens' from Summary 1. You should also have a number of mounted animal skeletons, and bones from different animals. The Science Centre may be able to help secure some of these.

Get each group to bring in a 'set' of fish or chicken bones. You will also need 3 to 4 sheets of paper for each group.

To 'clean' the bones the pupils should first boil them in water and then sprinkle some bleaching powder (such as Vim or Ajax) on to them.

If possible they should then brush the bones with a small brush, such as an old toothbrush.

They will then need some glue, thread and (black) cardboard to mount the skeleton on.

For Sections 5.3 and 5.4 you should have preserved specimens of as many of the vertebrates as possible and slides and photographs of the others.

Suggested Lesson Format

Introduction

Show the pupils a number of bones from different animals, let them handle these and then ask - what they are - what animal or type of animal they come from and whereabouts on the animal they come from. Allow some time for a general discussion about bones. Ask if anyone has ever seen a bone from a snail, a spider or an octopus. Bring out the point that they do not have any legs.

Activity

Let the pupils look at the specimens from Summary 1 to 'look for bones'. Introduce the word invertebrates for these "animals without backbones." Now show the mounted skeletons and let the pupils look at these. Introduce the word vertebrate.

Let the pupils work in pairs to produce a list of 5 vertebrates and 5 invertebrates (objectives 1 and 2). Ask the pupils to bring out the 'sets' of bones that they have brought in. Get them to set them out on the desk and allow a few minutes for them to look at and discuss the different sets.

Demonstrate how the bones should be cleaned, then let each group clean their set. You and the technician should help as needed.

When the bones are cleaned and dried, get the pupils to sort them out into a skeleton - again help if needed.

Show them how to mount the skeleton on a piece of black cardboard. Each group should label their display and write the names of the members of the group on their label. Arrange an 'exhibition' of the mounted skeletons. Try to get other teachers and pupils to visit the class to see the work. Let the pupils guide the visitors around pointing out the invertebrate specimens and the bones and skeletons of the different vertebrates. (objective 3).

After the exhibition ask the pupils to think of as many different vertebrates as possible.

Let each group prepare a list. Use the pupils suggestions to write a list of the names of 20 - 30 vertebrates on the board. Get the pupils to cut up or tear their sheets of paper into a number of slips and to write the name of one vertebrate on each slip. Tell them that now you want them to divide the animals into 5 different groups - but they must be able to tell you why each animal is in the group it is. Allow 5 to 10 minutes for the pupils to discuss and do this.

Discussion & Evaluation

Move around from group to group asking them to explain their groupings. Let one or two groups then explain to the class their grouping system. From the discussion bring out the five classes of vertebrates and let the pupils suggest the 'characteristics' or marks of each group, keep these relatively simple, for example;

Fish: all live in the sea or fresh water, their bodies have scales, they move with fins and most lay eggs which are covered in jelly. They breath under water.

Amphibians: Live on land and in fresh water but lay their eggs in water. No scales.

Reptiles: Can live on land or in water but breath out of water. Have scales and lay their eggs on land.

Birds: All have wings and feathers and lay eggs with hard shells.

Mammals: Their young are born live (not as eggs). They feed their young on milk from the mother's body. (Except for whales dolphins and porpoises) all mammals have hair.

Summarize these characteristics on the board then get the pupils to draw one example of each class and to write down its characteristics beneath the drawing.

Discuss each class in turn and ask the pupils for the names of 2 or 3 local examples of each. If possible have specimens, slides or photographs of a local example of each. (objectives 4 & 5).

LESSON

Unit 5

Topic 6

Grouping Living Things

Time

Four to five periods

Objectives

At the end of the Topic the pupils should be able to:

- 1) explain in their own words a major difference between
 - a) plants and animals
 - b) flowering and non-flowering plants
 - c) vertebrates and invertebrates
 - d) each of the five classes of vertebrates.
- 2) be able to use their understanding of
 - (1) to construct a simple key to help identify examples of (a) to (d) above.
- 3) be able to use this key to identify each of the following correctly.
 - a) man, dog, cat, cow, tenrec, rat, bat, sheep and goat.
 - b) duck, chicken, cardinal, myna.
 - c) tortoise, turtle, gecko, skink,.
 - d) frog, toad, caecilian,
 - e) tilapia, mudskipper, shark

f) spider, fly, cockroach, snail, butterfly, worm and cricket

g) hibiscus, bean, okra, egg plant, grass.

h) sea-weed, fern, mushroom, yeast and mould.

Equipment

In Topic 6 the pupils will again be asked to collect a variety of different species of plants and animals. They will need small jars plastic basins and some plastic bags. You will also need some fungi.

Suggested Lesson Format

Introduction

Revise Topic 5 by asking the pupils to explain the difference between vertebrates and invertebrates and to remember the five different classes of vertebrates, the characteristics of each and two local examples of each i.e objectives 1, 4 and 5.

Activity

Organize the pupils into groups for them to go out and collect as many different living things as possible. Remember to set some rules on what the pupils may or may not bring back.

Make a large collection of all the things the pupils have collected. (You may need to push two or three tables together to display them).

Discuss 5 or 6 of the items identifying them as animals or plants, vertebrates or invertebrates, class of vertebrates etc. Introduce the word species and explain the difference between plants such as hibiscus and non-flowering plants such as ferns.

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(Show the flowers on a number of grass type plants to make the point that they are flowering). Make a list on the board of the different groups you have talked about during the unit.

Plants

Animals

(Plants) -----> flowering |-----| non-flowering

(Animals) -----> vertebrates |-----| invertebrates

(vertebrates) ---> Fish, amphibians, reptiles, birds and mammals.

(Invertebrates)---> legs, no legs

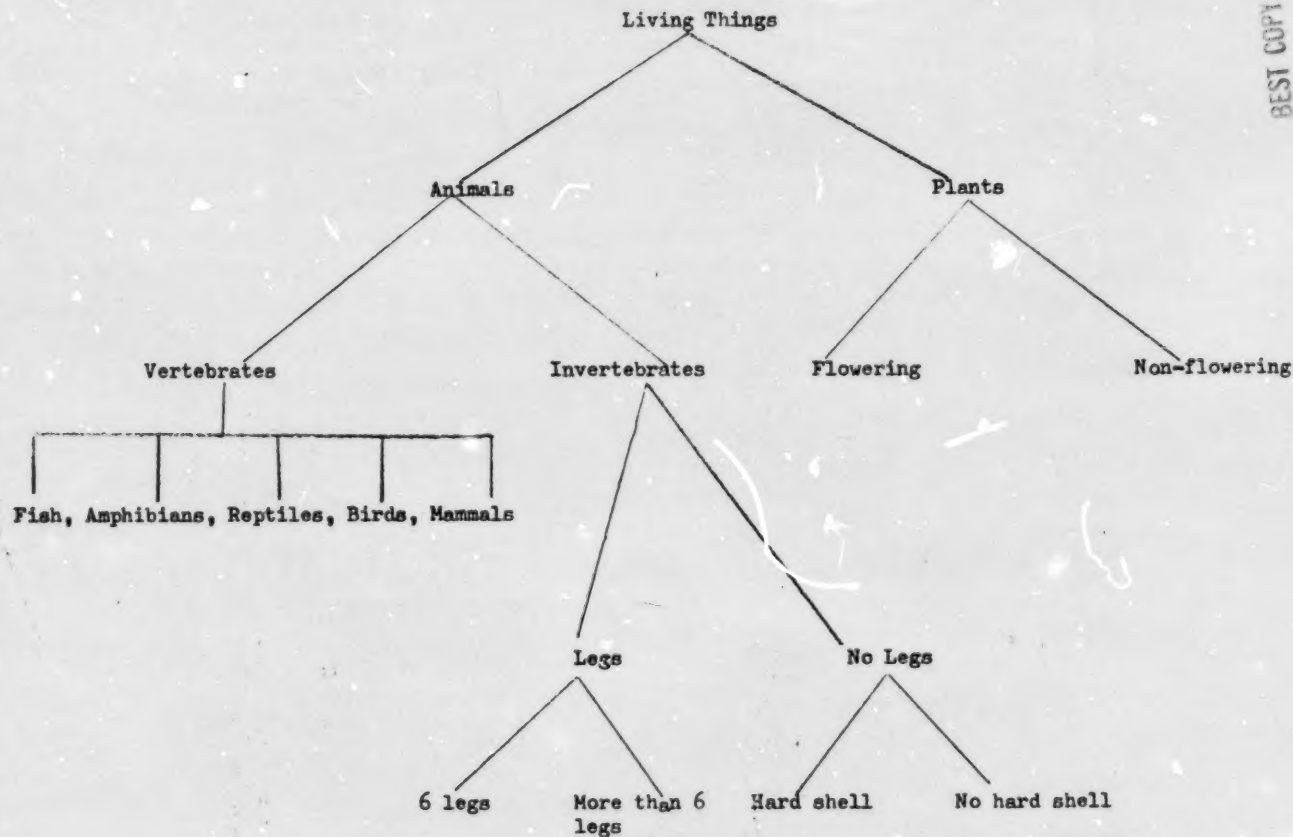
(No legs) -----> hard shell, no shell.

(legs) -----> six legs, more than six legs.

Let the pupils work in groups of 3 to prepare a key so that they can use the seven different 'decisions' above.

Discussion and Evaluation

Move around from group to group asking them to explain their key. Let one group draw their's on the board. (objective 1 and 2).



Get each pupil to copy down the key into their book. Show how to use the key to identify 3 or 4 animals listed in objective 3. List 8 or 10 others on the board and then ask the pupils to identify them using their key. Move around checking on their work.

Bring two or three different fungi around with you and show these to the pupils to help identify them as ~~non~~-flowering plants.

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SEYCHELLES
INTEGRATED
SCIENCE

Unit 5



SE045064

DIFFERENT LIVING THINGS

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WRITTEN BY: SCIENCE SECTION - NATIONAL INSTITUTE OF PEDAGOGY

1983

THE MINISTRY OF EDUCATION AND INFORMATION

REPUBLIC OF SEYCHELLES

SIMILARITIES AND DIFFERENCES

1.0 You are very special. There is nobody else in the world who is exactly like, or similar to, you. Now you can try to find out for yourself just how different you are from other people, and from other things around you.

1.1 Choose one person in your class who you think looks very different from you. Make a list of ten ways in which he, or she, is different. Write the heading: "DIFFERENCES" over this list.

Now try to make a second list of ten ways in which he, or she, is similar to you. Write the heading "SIMILARITIES" over this list.



1.2 Between two people, there may be many differences. However, there are many more similarities. It is the similarities between us which make us all people, or "human beings".

In Topic 1.1, you compared yourself with another person, or human being, in your class. Now look at an animal, such as a pig, cow, rabbit, dog or cat. How does this animal compare with a human being? Make a short list of some of the differences you notice. Try to list at least 10 similarities as well.



SIMILARITIES AND DIFFERENCES

- 1.3 So far, you have compared yourself with an animal and with another human being. You will probably agree that you are more similar to the human being than to the animal! However, you may find that you are more like the animal than you realise.

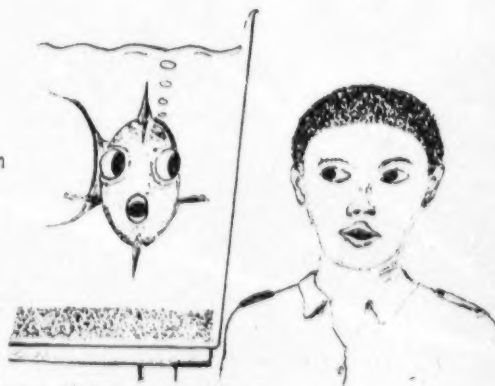
Compare yourself with each of the following:

- a "tilapia" or "gourzon" living in the aquarium;
- a hibiscus (or another plant growing near to the school);
- a lizard;
- a rock on the ground.



This time, write down only the similarities that you notice.

- 1.4 Now that you have compared yourself with many other things, write down which of them is most similar to you. Then, write down which of them is the next most similar. Do this for all the things that you have looked at, until you reach the one which is least similar to yourself.



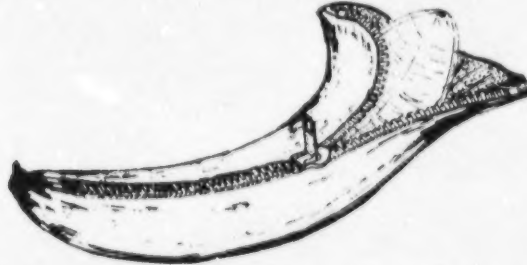
If you had to choose one of these things as the "odd one out", which one would you choose? Why?

LIVING AND NON - LIVING THINGS

2.0 A rock is different from a person, or a pig, or a plant because it is NOT LIVING. Let us see if we can find what the differences are between LIVING and NON - LIVING things.

2.1 Look at some different things, such as: a plant in a pot; a millipede; a ruler; sand; takamaka fruits; a pencil; a crab; a fish; a bottle.

Divide these into one group of living things, and another group of non-living things. How did you decide which ones were living ?



2.2 Here is a quiz game you can play. Ask a friend to think of something. You must then try to find out if that thing is living or not. You can ask not more than 5 questions about it, to which your friend must answer YES or NO. (You are not allowed to ask: "Is it living ?" or "Is it alive?"...)

Play the game with others in your group. After a few games, write down the 5 questions which were the most useful.

Use the questions to identify at least 10 different living things around the school. Make a list of these in your book.

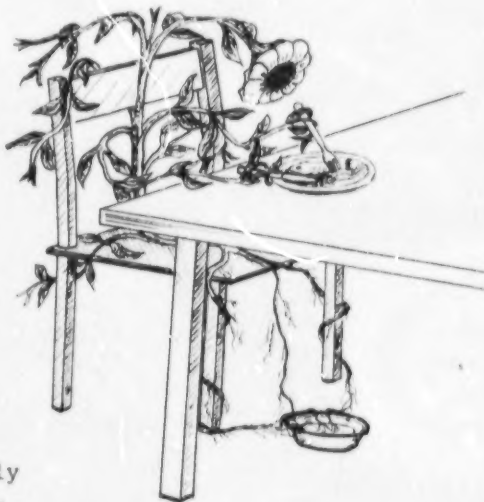
ANIMALS AND PLANTS

- 3.0 There are many, many thousands of different living things, or organisms, in the world. You could probably find quite a lot just around the school. Collect some of the living things that you have found, and bring them to your science class.
- 3.1 Look carefully at your collection of living things. Try to separate them into one group of ANIMALS and one group of PLANTS. Can you put all of them into one of these two groups?

Which group would you put yourself into, and why?

- 3.2 Discuss with your friends what makes plants different from animals. Make up a list of "rules" which say what plants are like. Then make up another list of rules to say what animals are like.

Write down your ideas on a piece of paper. Change your list of ideas with that of another group. Look carefully at their ideas. Try to think of some animals and plants which do not fit their rules.



Each group can take turns to challenge the rules of the other group. Discuss the "best" rules with the rest of the class and with your teacher. Write the best rules in your book.

DIFFERENT TYPES OF PLANTS

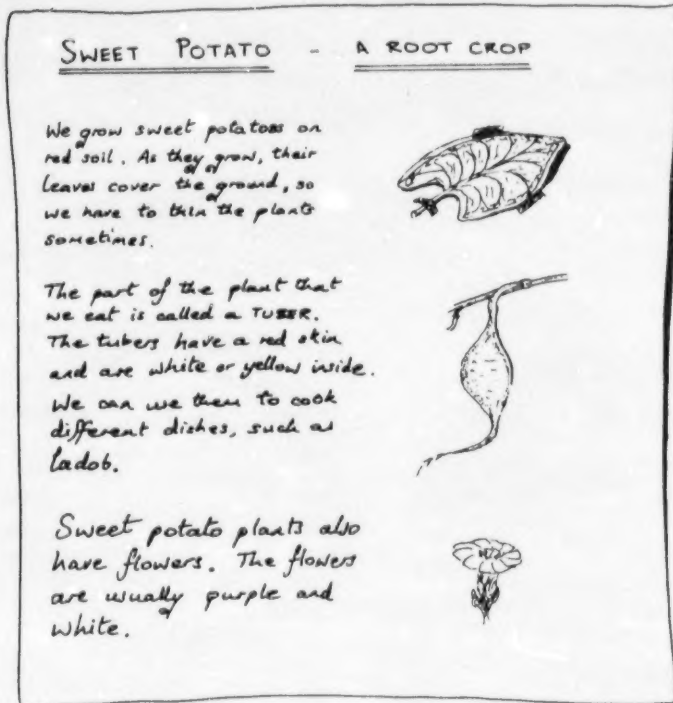
1. Many scientists agree on one rule for plants - that all true plants contain a special chemical called chlorophyll, which is usually green. This chlorophyll helps the plant to make its own food. Let us now look at some of the different types of plant that we can find in Seychelles.
2. We can learn more about the plants around us if we make our own "book" of plants. You and your friends can choose one group of plants to study,

For example: plants with no flowers; trees with fruits that we eat; plants used for medicine; trees used for wood (timber); plants that grow under water; crops we use in salads; plants we use for decoration; root crops...



DIFFERENT TYPES OF PLANTS

3. Look for several different plants from the group that you have chosen. Prepare a page for each one, like that shown below in the diagram:



4. On each page, you will need to write a few lines about the plant. You can stick one or two of its leaves, or other parts, on to the page. You can make drawings of interesting parts of the plant, especially the parts we use.

SOME SMALL ANIMALS

- 4.0 The study of living things is a part of science that we call BIOLOGY. A person who studies biology, a biologist, divides different living things into groups. Each group contains living things which have a similar structure or way of life. Now let's look at some small animals that we can find easily, and try to divide them into groups.

- 4.1 Collect and look at as many of these animals as you can:



COCKROACH
(Kankrela)



PALM SPIDER
(Bib)



MILLIPEDE
(Milpat)



SNAIL
(Kourpa)



SEA HARE
(Banbara)



ANT
(Fourmi)



EARTHWORM
(Leverdter)



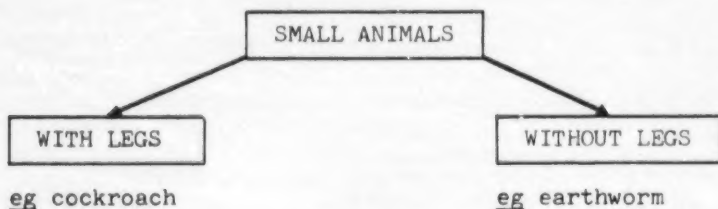
TECTON
(Tekton)

- 4.2 Discuss with your friends how you can divide these animals into different groups. Each animal in a group must be similar, in at least one way, to all of the other animals in that group.

In your book, list the animals in each group. Explain how the animals in each group are similar to each other.

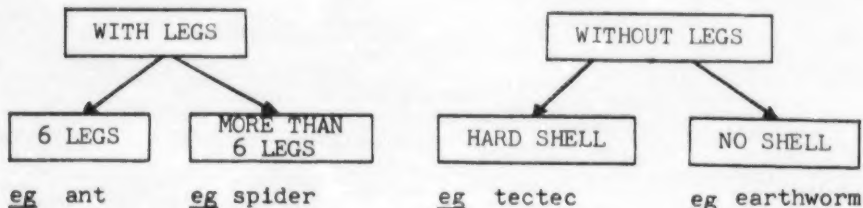
SOME SMALL ANIMALS

- 4.3 When we study biology, we often need to know exactly how one animal is different from another. This makes it easier to identify the animal. To help us to do this for our "small animals", we can first divide them into two groups. For example:



In your book, write down a complete list of "small animals" for each of these two groups - with legs or without legs.

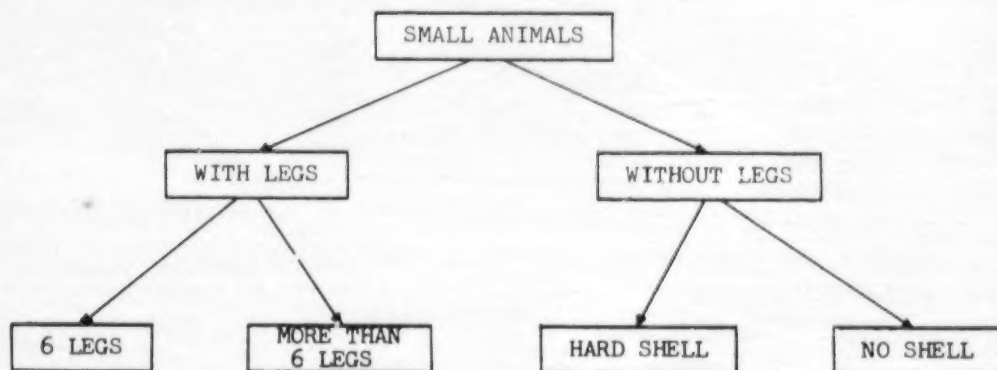
- 4.4 We can divide each group again into smaller groups. For example:



Try to add some more examples to each of these 4 groups from your list of small animals. See if you can think of other ways to divide these groups again.

USING A KEY

1. In Topic 4, we divided some small animals into groups. To do so, we looked at the differences between them, one at a time. We can also use a chart, called a KEY in the same way.



2. Use the key above to help you to put these animals into the correct group:



BARNACLE
(Bernik)



OCTOPUS
(Zourit)



BUTTERFLY
(Papiyon)



SPIDER
(Bibouk)



RAGWORM
(Sanpye delo sale)



WOODLOUSE
(Pti torti)



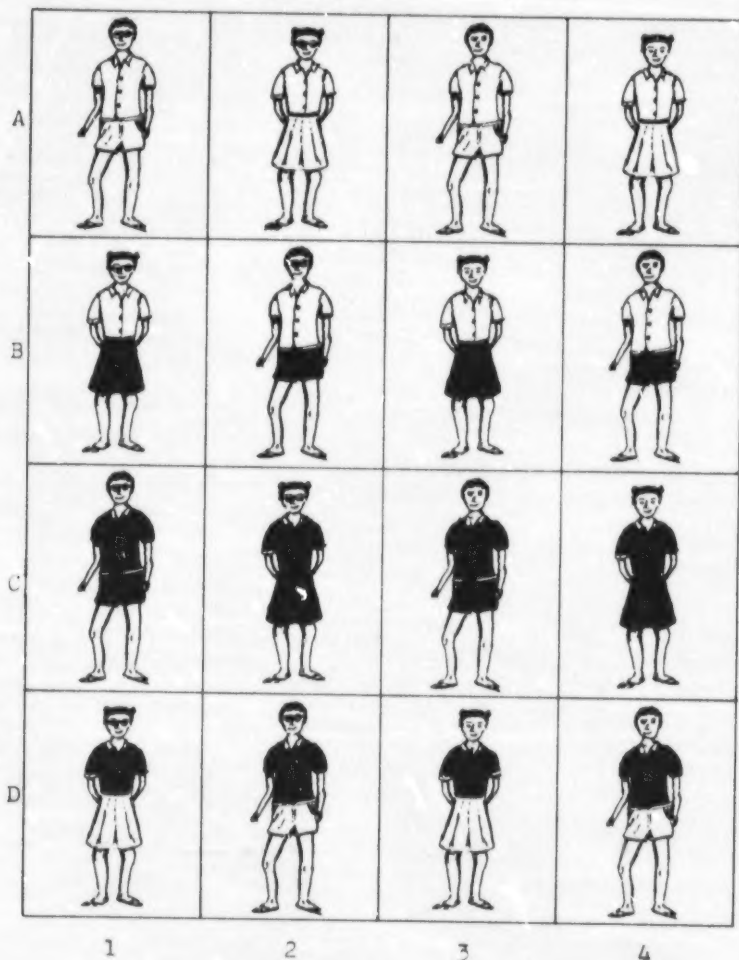
PEN SHELL
(Lasdarm)



CRICKET
(Grele)

MAKING A KEY

- We have already learnt how to use a key to identify something. Now let's see if we can also make a key ourselves.
- Look at the children in the pictures below. Are any two of them exactly the same ?



MAKING A KEY

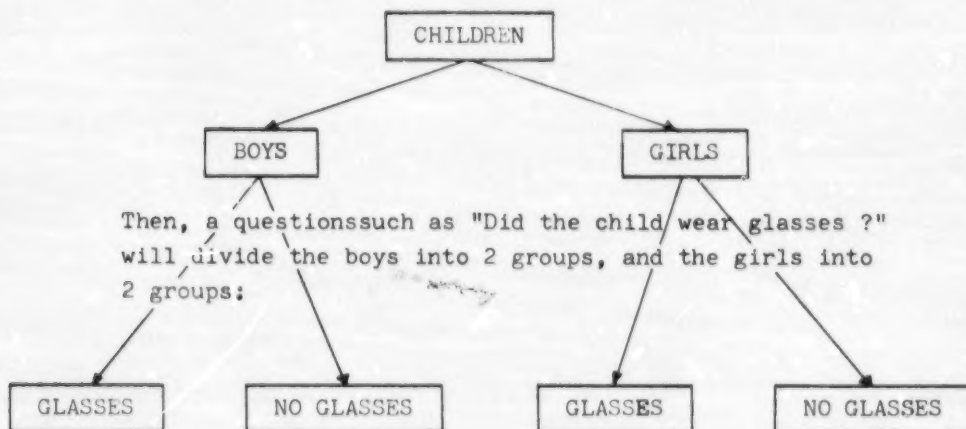
3. Mrs X. has seen one of the children in the pictures stealing. You must try to find out from Mrs X. what the child looked like, so that you can catch the thief. You can ask Mrs X. only 4 questions. She can answer only YES or NO.

Write down the 4 questions that you would ask in your book.

4. Now you can use the questions that you have asked to help you to make up your own key. For example, the question:

"Was it a boy ?" OR "Was it a girl ?"

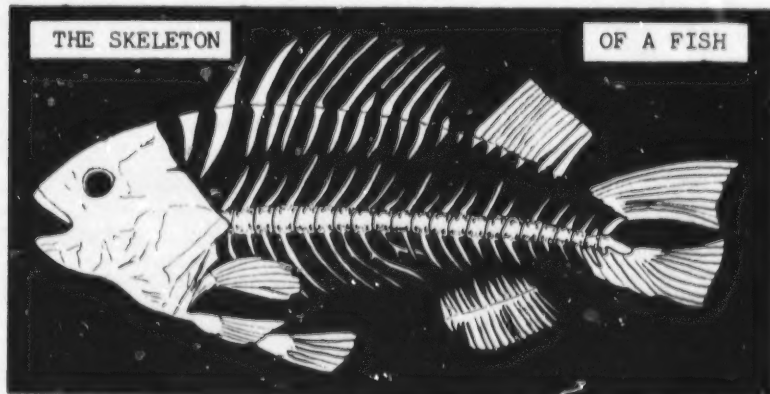
will divide the children into two groups, BOYS and GIRLS.



5. Now use another question to divide these 4 groups into 8 groups, and then your last question to make 16 groups. Draw your key in your book.

ANIMALS WITH BACKBONES

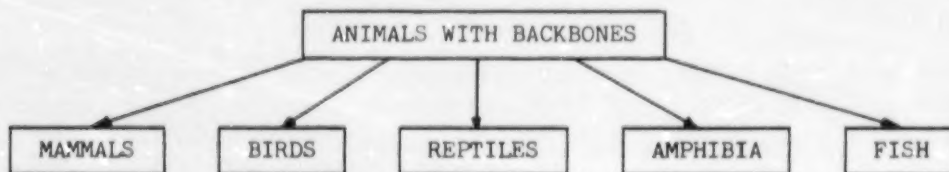
- 5.0 We can divide all of the animals in the world into two large groups: ANIMALS WITH BACKBONES (vertebrates) and ANIMALS WITHOUT BACKBONES (invertebrates). Look again at each of the small animals that you studied in Topic 4. Which of these two groups do you think your small animals belong to ?
- 5.1 In your book, make a list of ten animals which you think have backbones. (It may help you to think of some of the animals that you eat.) Do you eat any animals that do not have backbones ? Which ?
- 5.2 Collect the bones from some different animals, for example fish and chickens. Try to collect all of the bones bones that the animal has, to make a complete set, or SKELETON. Clean them as well as you can, and bring them to school. (Your science technician can help you to clean them properly.)



When you have one whole skeleton, use some glue and some thread to stick the bones onto a piece of black card. Arrange the bones so that you can clearly see what the skeleton of the animal looks like.

ANIMALS WITH BACKBONES

- 5.3 When we are dividing living things into groups, it is not always easy to divide one large group into 2 small groups. For example, we divide the group of animals with backbones into five smaller groups:



Discuss the differences between these five groups, with your teacher, and write down a sentence about each one.

- 5.4 Put each of these animals with backbones into one of the five main groups:



GRASS SNAKE
(Koulev)



TURTLE
(Tortimer)



FLYING FISH
(Pwason volan)



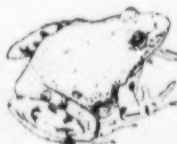
MUDSKIPPER
(Kato soter)



FRUIT BAT
(Sousouri)



GOAT
(Kabri)



FROG
(Grenuiy)

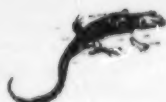


DUCK
(Kannar)

GROUPING LIVING THINGS

6.0 There are very many different types, or species, of living things in the world today. We have learnt that we need to divide these living things into many different groups so that we can identify each species.

6.1 Look at the following things. Collect as many of them as you can from around the school. Use what you have learnt about living things to make a key to identify each one:



LIZARD
(Lezar)



FERN
(Fouzer)



SNAIL
(Kourpa)



GRASS
(Zerb)



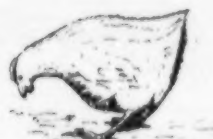
BEAN
(Zariko)



SPIDER
(Bibouk)



SEAWEED
(Gomon)



CHICKEN
(Poul)



TILAPIA
(Talafya)



FROG
(Grenuiy)



CAT
(Sat)



FLY
(Mous)

GROUPING LIVING THINGS

- 6.2 It is not always easy to put any one living thing into the "correct" group. In Seychelles, there are some living things which are difficult to identify.

Try to collect some "FUNGUS" to look at - for example:

YEAST (leven) that we use to make bread;

MUSHROOMS (sanpignon, zorey dibwa) that grow on dead, wet wood;

MOULD (mwazi) that grows on wet, or damp, food.



Would you put these fungus into a group with animals, or with plants? Give a reason for your choice.

- 6.3 There is an animal that lives in the Seychelles called the caecilian; some people call it gro leverdter nwar. It lives in wet places - the mud by rivers, in wet leaves and so on. It is long like a snake, but has no scales. It has black, bare skin which it must keep wet. It has bones inside its body.

Which group of animals would you put the caecilian into? Give reasons for your choice.



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